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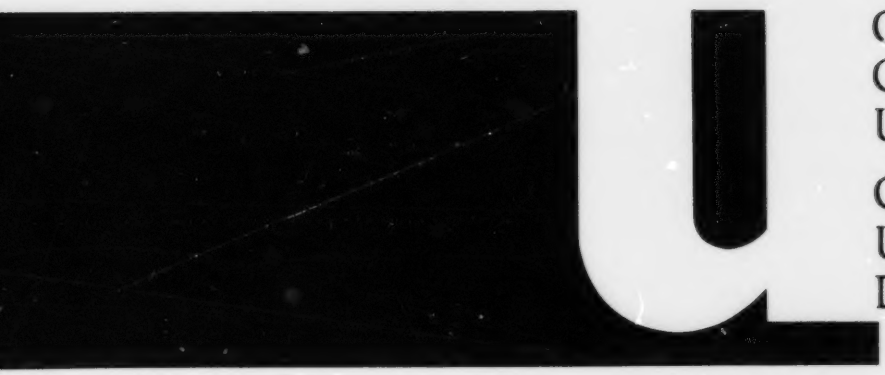
RENEWAL OF THE PROFESSORIATE

Report of the COU Task Force
on Faculty Renewal



COUNCIL OF ONTARIO UNIVERSITIES

CONSEIL DES UNIVERSITÉS DE L'ONTARIO

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RENEWAL OF THE PROFESSORIATE

Report of the COU Task Force on Faculty Renewal

Council of Ontario Universities
Conseil des Universités de l'Ontario
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EXECUTIVE SUMMARY

Universities across North America will in all likelihood experience increased rates of turnover in the professoriate as the large cohorts of faculty members hired in the 1960s begin to retire in large numbers in the late 1990s. This forecast of increased turnover and the resulting increase in demand for replacement faculty has given rise to serious concern in some quarters - concern that there will be shortages of qualified replacement faculty in most jurisdictions and in most disciplines.

In response to this concern the Council of Ontario Universities has commissioned a study of the factors influencing the future demand for replacement faculty at Ontario's universities, accompanied by an assessment of trends in future sources of supply for qualified replacement candidates. This report, which represents the culmination of two years' effort by the Task Force on Faculty Renewal, is among the most thoroughgoing studies of the future academic labour market conducted in any jurisdiction to date.

Before moving to a presentation of its findings, the Task Force wishes to remind the reader that this report is a study of supply/demand trends at the *broad disciplinary level*, that is to say at the level of five major groupings of disciplines. The report does not attempt to assess sub-disciplinary trends. The Task Force is aware that there are at present shortages of qualified replacement faculty in computer science, nursing, and economics to cite but three examples.

The analyses suggest that faculty supply in Ontario will be largely dependent on external market forces. Should those market forces remain unchanged from those prevailing in 1990, shortages of replacement faculty will be confined to the humanities and will be comparatively modest in scale. Should the international academic labour market become considerably more competitive, as has been suggested by other studies, our analyses indicate that Ontario will experience shortages in the humanities, the biological sciences, and in the physical sciences, and these shortages would be acute.

The more optimistic forecast described above arises principally from the fact that Ontario's universities have significantly increased enrolment in doctoral programs over the past decade, and that the future pool of qualified replacement candidates will be sufficient to meet increased demand. The less optimistic forecast must also be considered, however, because Ontario recruits a significant portion of its replacement faculty from other jurisdictions and other employment sectors.

The report therefore concludes on a strong cautionary note that, while it would not be appropriate to signal an impending crisis, it would be equally inappropriate to declare that all is well. The Task Force urges Council to maintain a watching brief on the academic labour market, and to continue the analytical work that it has started.

TERMS OF REFERENCE AND MEMBERSHIP

Terms of Reference

The Task Force was charged to develop a report which sets out the quantitative dimensions of the faculty recruitment problem, and with the specific mandate of developing a simulation model to aid in policy development.

The membership was comprised of representatives of the university community together with representatives of the Ontario Confederation of University Faculty Associations (OCUFA), the Association of Universities and Colleges of Canada (AUCC), the Ministry of Colleges and Universities (MCU) and the Ontario Council on University Affairs (OCUA).

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The Task Force extends its special thanks to Martin England of the University of Toronto who prepared the report. It also wishes to acknowledge the editorial assistance by Peter O'Brien of the University of Toronto. Sheila Cannon, Realino Cinco and Arlene Levine of the COU Secretariat also assisted in the analysis of the background data and in the preparation of the report.

* *Also served on the Working Group struck to deal with technical issues associated with the work of the Task Force.*

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1 INTRODUCTION

1.1 Rationale for the Study

Ontario's universities have entered the 1990s with a sense of uncertainty and apprehension regarding the prospect of a highly competitive academic labour market, predicted to occur toward the latter part of the decade. In particular, as the result of a 1989 study that predicts serious shortages of replacement faculty in the United States, the international academic community has been prompted into an examination of faculty demography and future replacement requirements. In their study *Prospects for Faculty in the Arts and Sciences*, William Bowen and Julie Ann Sosa cite a projected increase in faculty retirements, coupled with a lack of growth in doctoral enrolment, as the principal factors that they believe will lead to large-scale shortages in replacement faculty in the late 1990s.

These projections have prompted concern in other jurisdictions. The Association of Universities and Colleges of Canada (AUCC) commissioned a study of potential faculty shortages in Canada, and concluded that shortages may indeed occur unless "a series of appropriate actions are taken now."[1] Similarly, the Australian Department of Employment, Education and Training concluded that the international market will not be a reliable source for large-scale replacement requirements forecast to occur in that country:

> [T]he fact that a number of major English-speaking academic labour markets (U.S., U.K., and Canada) are almost certain to encounter recruitment difficulties over the next 10-15 years suggests that these countries are unlikely to represent major sources of supply into Australian higher education in the future.[2]

Universities in the United Kingdom percieve themselves to be quite vulnerable to the implications of these projections of international shortages, and have reported increased rates of turnover in their faculty complement.

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[1] Association of Universities and Colleges of Canada (AUCC). *Averting Faculty Shortages*. Ottawa: A.U.C.C., 1991, 27.

[2] Australian Department of Employment, Education and Training. *Study of the Labour Market for Academics*. Canberra: viii.

The projection of shortages in the United States present two related questions: do the demographic conditions prompting Bowen and Sosa's projection also exist in Ontario; and, even if those conditions did not exist, would Ontario's universities experience the indirect effects of shortages in the United States?

The issue of potential faculty shortages has been a matter of high priority for Ontario's universities and related organizations. The Ontario Confederation of University Faculty Associations (OCUFA) has worked vigorously to establish the issue of faculty renewal as a priority with the Ministry of Colleges and Universities (MCU), the Ontario Council on University Affairs (OCUA), and with the legislature's Standing Committee on Finance. The universities, individually and collectively, have urged OCUA to introduce preventive measures, such as the funding of increases in doctoral enrolment.

The Minister of Colleges and Universities ultimately requested that the Council of Ontario Universities (COU) and OCUFA cooperate in a study of potential faculty shortages in Ontario. The idea of such a study was supported by OCUA, which wanted to resolve the uncertainty surrounding future academic labour market conditions:

> Substantial differences exist in projections regarding the degree of future faculty staffing problems for the Ontario university system. The absence of exhaustive analysis based on firm data therefore precludes a pre-judgment by Council regarding the magnitude and timing of faculty staffing problems. While Council is not in a position to frame policy recommendations at this time, it underscores the need for further study. In this regard, Council supports the collaborative efforts which are underway to develop a thorough study of future faculty staffing bottlenecks in the Ontario system.[3]

Accordingly, the COU established the Task Force on Faculty Renewal, whose mandate was to "develop a report which sets out the quantitative dimensions of the faculty recruitment problem, and with the specific mandate of developing a simulation model to aid in policy development"[4]. This report is the product of

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[3] Ontario Council on University Affairs. *Retirement and Recruitment: The Challenge of Human Resource Planning in Ontario Universities in the 1990s.* Toronto: OCUA, 1991, 33.

[4] See the terms of reference and membership of the Task Force.

the Task Force's deliberations, and represents the culmination of nearly two years of effort in data assembly and analysis.

1.2 The Task Force's Approach to the Problem

In setting out to construct a series of predictive models to assess the dynamics of faculty demography the Task Force began by framing the principal questions:

What do we know about the existing professoriate?

- Will the current age profile give rise to increased rates of turnover in the near future?
- Will rates of turnover vary across disciplinary groups?

Are Ontario's universities currently losing faculty members to other jurisdictions?

- Would an increase in demand for replacement faculty in other jurisdictions have a significant impact on Ontario's prospects for retaining and recruiting faculty members in the future?

What are the principal sources of supply for replacement faculty at Ontario's universities? Are those sources stable, increasing, or declining?

Is Ontario well positioned to compete with other universities and with other employment sectors in the event that the labour market for doctorate holders experiences future pressure? What factors should be considered in assessing Ontario's competitive position?

The Task Force adopted an iterative process in answering these questions: data collection, data validation, supplementary data collection, model building, and model refinement. The Task Force has thus attempted to assemble a complete and reliable basis upon which the quantitative aspects of the faculty renewal issue could be addressed.

1.3 Scope of the Analysis

The analyses contained in this report include faculty members in the following major disciplinary groups:[5]

- Humanities and Related
- Social Sciences and Related
- Agricultural and Biological Sciences
- Engineering and Applied Sciences
- Mathematics and Physical Sciences

Faculty members in Education, Fine and Applied Arts, Law, Veterinary Medicine, and the Health Professions and Occupations were specifically excluded from the scope of this study. These exclusions were deliberate; not only are the required academic qualifications somewhat different for faculty in these disciplines from the professoriate at large, but there is also a considerable migration of individuals in these disciplines between postsecondary education and other employment sectors. In the case of Education, the Task Force was aware of a separate study undertaken by the Teacher Education Council of Ontario (TECO) and did not wish to duplicate those efforts.

The analyses are confined to full-time members of the tenure stream professoriate and to those faculty members holding full-time, contractually limited appointments. The study specifically and deliberately excludes part-time faculty, due to the lack of complete and reliable data about this group. The Task Force invited the authors of a recent report on part-time faculty to present their preliminary findings, and it is apparent both to the authors of the report and to the members of the Task Force that there remain significant gaps in our knowledge of part-time faculty.

In certain disciplines and at certain institutions part-time faculty carry a significant proportion of teaching duties. In its concluding observations the Task Force returns to the issue of part-time faculty, suggesting that further data gathering and analysis take place.

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[5] See Appendix B for a mapping of sub-disciplines into the major disciplinary groups.

1.4 Organization and Presentation of the Task Force Findings

In its presentation of findings the report will follow the sequence in which the Task Force addressed the major analytical questions. The analysis begins with an assessment of factors influencing future demand for replacement faculty: a profile of the existing faculty complement and a profile of those who leave. The report then proceeds to a discussion of issues surrounding the supply of replacement faculty: what are the traditional sources of supply for Ontario's universities, and what are the related trends in these sources of supply.

This is followed by an assessment of Ontario's competitive position vis-à-vis other employment sectors and universities in other jurisdictions. The factors measured include compensation, workload and comparative levels of resources available to faculty members.

The results of the supply/demand simulations are then presented for each of the major disciplinary groups within the scope of the study.

The report concludes with a discussion of the results of the simulations, and identifies issues inviting further study by the COU and its member institutions.

In the course of its deliberations the Task Force has gathered a comprehensive body of statistical information describing the professoriate, doctoral enrolment, and the labour market for doctorate holders. This information, along with a detailed description of the simulation models, has been assembled into a volume of Appendices to this report. The figures and tables presented in this report have been drawn from the appendix materials; at the bottom of each figure or table the appropriate appendix table has been noted.

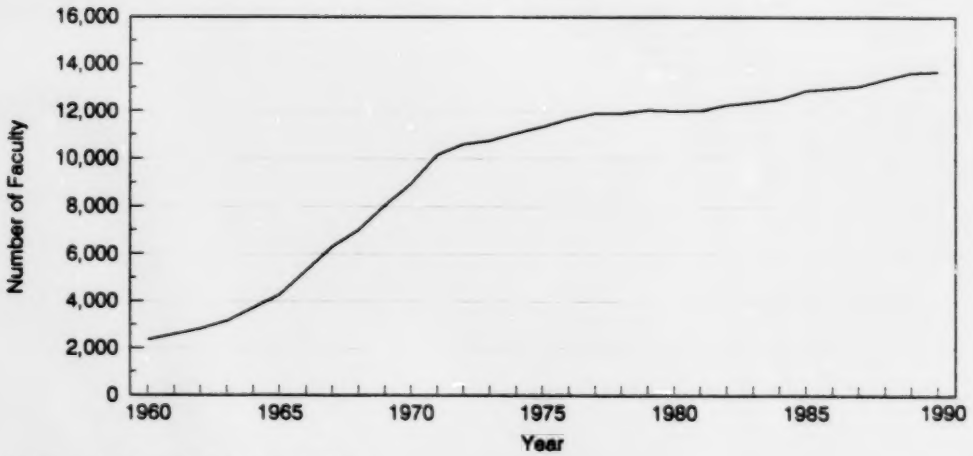
2 FACTORS INFLUENCING FUTURE DEMAND

Statistics Canada databases have served as the basis for the profile of the existing professoriate (as of November 1989) and for the analysis of faculty terminations between 1986 and 1989. In order to validate and enhance the information relating to terminations, the Task Force administered a survey to universities concerning faculty members who left Ontario's universities in that period. The survey corroborated and expanded upon the Statistics Canada data.

The current profile of Ontario's professoriate is primarily a product of the rapid expansion of the universities, which began in the mid-1960s. (See Figure 1) There is a commonly held view that universities across North America will experience recruitment difficulties as the large cohorts of faculty members hired in the 1960s reach retirement age in the 1990s.

FIGURE 1

FULL-TIME ONTARIO FACULTY
1960 to 1990



Note: Includes faculty in all disciplines.

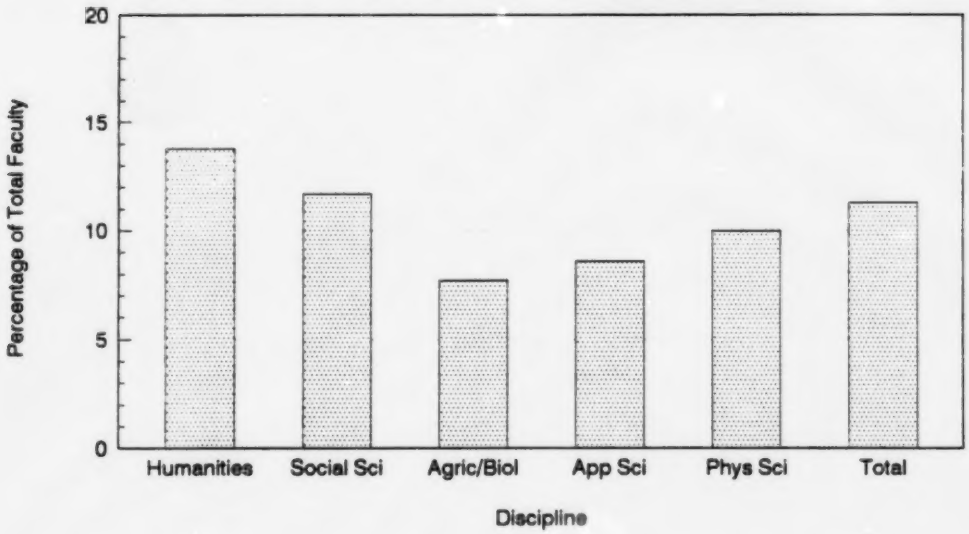
Source: Table C.5 (derived from Universities and Colleges Academic Staff System (UCASS) database).

However, a careful review of the data suggests that future replacement requirements are not a simple "echo effect" of past hiring trends. While the age profile of the professoriate is a significant determinant of future requirements, it is not the sole determinant.

First, a projection of replacement requirements must take account of the fact that approximately one-tenth of Ontario's faculty hold contractually limited appointments (see Figure 2) and that this portion of the professoriate experiences an annual turnover rate in excess of 25%. Comparatively few faculty on contractually limited appointments continue at that status until retirement, and Ontario's universities are engaged in frequent replacement of this portion of the complement.

FIGURE 2

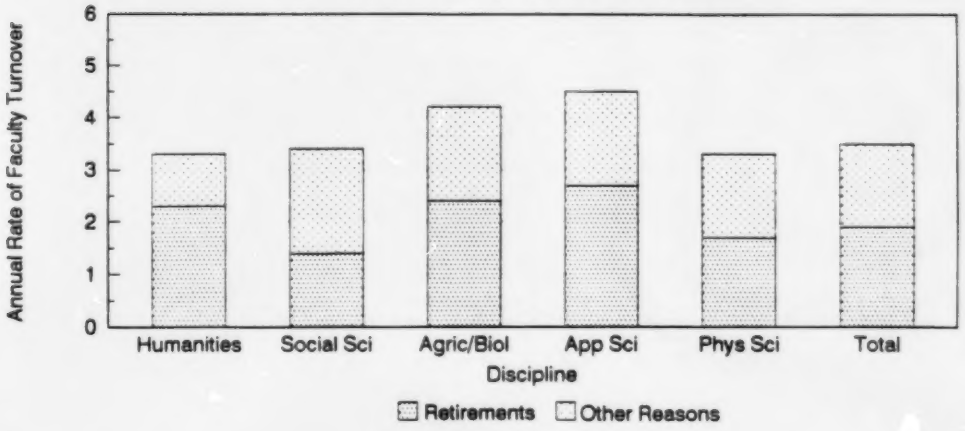
FULL-TIME CONTRACTUALLY LIMITED FACULTY AS A PERCENTAGE OF TOTAL FULL-TIME ONTARIO FACULTY, 1989



Source: Table C.1 (derived from UCASS database).

FIGURE 3

ANNUAL RATE OF FACULTY TURNOVER BY DISCIPLINE, TENURE STREAM, 1986-87 to 1988-89



Note: Faculty turnover is expressed as a percentage of faculty complement.
Source: COU Survey of Faculty Leavers and New Appointments.

Second, the data indicate that turnover occurs across all age groups among tenure stream faculty, and that retirement accounts for only three-fifths of this turnover.[6] Thus, even if the projected rate of retirement were to increase substantially, it does not necessarily follow that the total rate of replacement of the professoriate will increase in the same proportion. The COU survey of Faculty Leavers and New Appointments currently indicate a 3.5% annual rate of turnover among tenure stream faculty, of which retirement accounts for 2.2%. (See Figure 3)

Of the remaining 40% of faculty who leave an Ontario university for reasons other than retirement, 9% leave to pursue careers outside the university employment sector, and 24% to take up an appointment at another university (including another Ontario university). Mortality accounts for the balance of the turnover. Comparatively few faculty members (8% of total turnover) have left to take up appointments in the United States and Europe. (See Figure 4)

These data have formed the basis for the development of a "faculty flow" model that projects future replacement requirements at the disciplinary level (see Appendix I). Retirements are projected to occur at age 65, mortality tables have been applied to the faculty population, and turnover for other reasons is assumed

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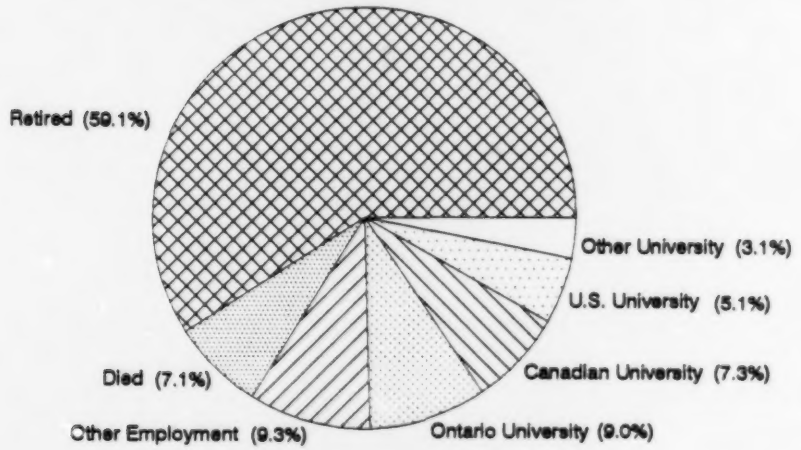
[6] It should be noted that turnover figures include transfers between Ontario universities.

FIGURE 4

NEW EMPLOYMENT STATUS OF FACULTY TERMINATIONS TENURE STREAM, 1986-87 to 1988-89



Source: Table D.2 (COU Survey of Faculty Leavers and Appointments).

to occur at the rates suggested by recent termination data. The model has been constructed to perform simulations of replacement requirements under different sets of assumptions.

Having constructed a model that could test the sensitivity of future replacement requirements to changes in critical variables, the Task Force identified an array of simulations to be examined in a preliminary fashion at the aggregate level (i.e., taking all discipline groups together). The simulations considered by the Task Force were grouped into the following categories:

2.1 Changes in Total Levels of Faculty Complement
2.2 Changes in Rates of Faculty Turnover
2.3 Changes in the Appointment Profile of the Existing Faculty Complement

In order to gauge the relative sensitivity to various assumptions, each of these simulations was measured against a model that assumed no change in current patterns of turnover. This "base case" model suggests that Ontario's annual faculty replacement requirements will increase from 473 in 1990 to 487 in 1995, and to 542 by the end of the decade, an increase of 15%. The increased replacement requirement is entirely attributable to increased rates of retirement. All other variables are held constant.

2.1 Simulations of Changes in Total Complement

Simulations in this category amount to an indirect assessment of the effects of government fiscal policy toward universities on future replacement requirements, and whether conditions will improve or deteriorate further. The simulations also assess the requirement for increases in faculty positions needed to arrest the deterioration in student/faculty ratios.

The first model assumes a 10% reduction in faculty complement between 1990 and 1995. This approximates the impact of the withdrawal of positions funded under the Faculty Renewal program, coupled with the complement reductions that will likely arise from the transfer payment restraint recently announced by the Treasurer of Ontario.

Number of Replacement Faculty	*1990*	*1995*	*2000*
No Change in Current Patterns	*473*	*487*	*542*
10% Reduction in Faculty Complement	*473*	*280*	*508*

This suggests only a minor change in the long-term demand projection, but a dramatic reduction in recruitment in the near term. Under such conditions Ontario's universities would be constraining recruitment at a time when competitive pressures are comparatively moderate.

The Task Force then considered the effects of a more optimistic set of assumptions concerning financial support to universities from the provincial government. Under this simulation, new faculty positions would be added to the existing complement over the next decade at a rate that would gradually restore student/faculty ratios to 1977-78 levels. The choice of 1977-78 as a reference point was because this was the last year in which government accepted the advice of its own advisory body (OCUA) on the level of funding required to sustain university operations.

Number of Required Faculty	*1990*	*1995*	*2000*
No Change in Current Patterns	*473*	*487*	*542*
Additional Faculty to Restore Student/Faculty Ratios	*473*	*694*	*783*

This simulation quantifies the cumulative effects of enrolment growth coupled with fiscal restraint. An additional 200 to 250 positions each year for the next decade would be required to correct the damage sustained since 1977-78.

The foregoing simulation corrects for the past underfunding of enrolment increases, but does not take account of continuing increases in enrolment levels. A further simulation assesses the requirement for additional faculty recruitment if past deterioration in the student/faculty ratio is corrected, plus a 10% increase in faculty complement by the end of the decade in order to accommodate current and prospective enrolment increases.

Number of Required Faculty	*1990*	*1995*	*2000*
No Change in Current Patterns	*473*	*487*	*542*
Additional Faculty to Restore and Sustain Student/Faculty Ratios	*473*	*798*	*904*

Barring a significant change in government fiscal policy, this simulation indicates that Ontario's universities would be hiring between 300 and 350 fewer faculty members each year for the next decade than would be required to sustain student/faculty ratios at 1977-78 levels.

2.2 Changing Rates of Turnover

Should international shortages in replacement faculty occur, Ontario's universities will likely experience increased turnover as members of the professoriate respond to opportunities for greater mobility. The Task Force considered the impact of a 10% increase in the rate at which faculty members leave to take up a position elsewhere.

Number of Replacement Faculty	*1990*	*1995*	*2000*
No Change in Current Patterns	*473*	*487*	*542*
10% Increase in Faculty Turnover	*473*	*515*	*569*

Thus if there were to be a moderate increase in faculty mobility, future replacement requirements would not be significantly affected.

If, however, large-scale shortages occur internationally and Ontario faculty members take advantage of this increased opportunity for mobility, turnover rates could easily increase by more than 10%. The Task Force examined a more extreme simulation that assumed a 50% increase in faculty turnover for reasons other than retirement.

Number of Replacement Faculty	*1990*	*1995*	*2000*
No Change in Current Patterns	*473*	*487*	*542*
50% Increase in Faculty Turnover	*473*	*606*	*652*

Under conditions of comparatively high faculty turnover, Ontario's replacement requirements would increase by more than 100 faculty members each year.

2.3 Changes in the Appointment Profile of the Complement

The next set of simulations are of a strategic nature: they assess the impact of changing the mix of tenure stream and contractually limited appointments within fixed complement levels. Universities tend to make proportionately more contractually limited appointments in times of fiscal uncertainty and in response to (what are perceived as) temporary enrolment pressures. Ultimately, the choice of contractually limited rather than tenure stream appointments is within the control of the universities, and the mix chosen by a particular university can affect its future replacement requirements. Due to the higher rate of turnover among contractually limited faculty, a university with proportionately fewer contractually limited faculty will experience lower replacement requirements, but at the expense of reduced financial flexibility.

The first simulation projects the effect of doubling the number of contractually limited appointments by the end of the decade, with a corresponding reduction in tenure stream positions.

Number of Replacement Faculty	*1990*	*1995*	*2000*
No Change in Current Patterns	*473*	*487*	*542*
Doubling of Contractually Limited Appointments	*473*	*518*	*610*

The second simulation assesses the effects of phasing out contractually limited appointments by the end of the decade.

Number of Replacement Faculty	*1990*	*1995*	*2000*
No Change in Current Patterns	*473*	*487*	*542*
Phase out of Contractually Limited Appointments	*473*	*454*	*471*

These two models illustrate that universities themselves can significantly influence future replacement requirements through their appointment practices.

Used in isolation, these projections of aggregate demand under different circumstances are not useful as planning tools. They are intended, rather, to display the sensitivity of the faculty flow model to changes in major variables. After considerable deliberation, the Task Force selected three of these models for its assessment of supply/demand under constant levels of total faculty complement at the discipline level:

- High Demand: 50% Increase in Attrition
- Medium Demand: No Change in Current Patterns
- Low Demand: Phase Out of Contractually Limited Appointments

The results of these selected simulations are set out in Chapter 4, where they are juxtaposed to projections of supply. Future replacement requirements cannot be predicted with certainty, but these three models present a credible range within which future demand is likely to fluctuate.

3 FACTORS INFLUENCING FUTURE SUPPLY

3.1 Current Sources of Supply

Perhaps the most painstaking aspect of the Task Force's work was in the development of a model that could credibly project future sources of supply of replacement professoriate. Development of the model first meant a detailed examination of Statistics Canada data on faculty appointments from 1986 through 1989, in order to understand the current sources of supply and their relative importance. As in the case of its review of faculty termination data, the Task Force administered a survey of recently-appointed faculty members in order to validate and enhance the Statistics Canada data.

The analysis of the appointments data suggests that two-fifths of newly appointed faculty members in Ontario are Canadians who have either recently completed their doctorate or completed all but the defence of their thesis, with the balance coming from other sources. (See Table 1)

TABLE 1

FULL-TIME ONTARIO FACULTY APPOINTMENTS BY PREVIOUS ACTIVITY
1986-87 to 1989-90

	Appointments	
Previous Activity	#	%
Canadians With Recently Earned Doctorates[1]	624	28.7
Canadians With No Doctorate (previously students)	240	11.0
Employed in University		
- in Canada (excluding Ontario)	331	15.2
- outside Canada	293	13.5
Employed in Non-University Sector	362	16.6
Other Activity	328	15.1
Total	2,178	100.0

[1] Within five years of receipt of the doctoral degree (regardless of previous activity).

Source: Table E.3.1 (derived from UCASS database).

There is an important observation to be drawn from these data. Ontario recruits 14% of its new faculty from universities outside Canada and a further 15% from universities in other Canadian provinces. When compared to information on those who have left Ontario's universities, this reveals a net migration into Ontario from universities in other jurisdictions. Similarly, there is a net migration from other employment sectors to the universities. Projections of future supply will therefore be very sensitive to the assumption about the extent to which Ontario's universities can continue to recruit from other universities and from other employment sectors.

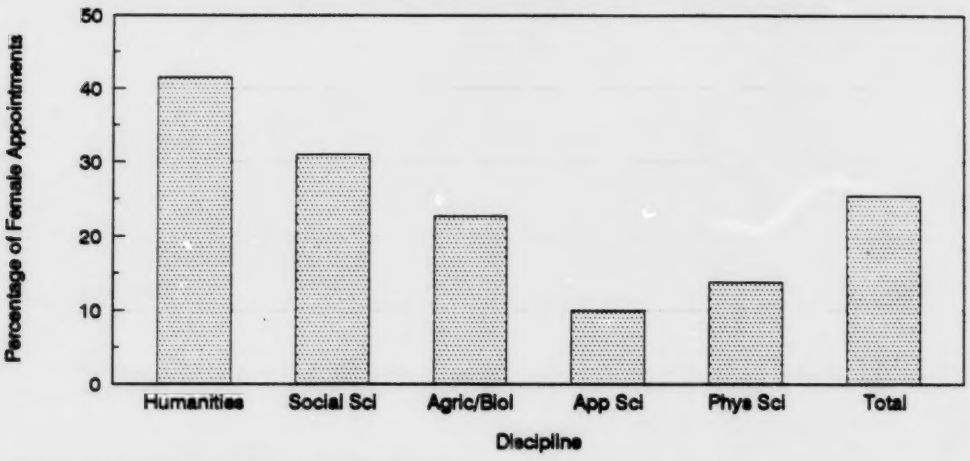
In the simulations that follow, the Task Force elected to test the sensitivity of the supply model to a 50% reduction in the number of faculty to be recruited from universities outside Canada. This is intended to simulate the effects of heightened international competition, should future shortages occur.

During its review of the faculty appointments data, the Task Force observed a number of trends that do not bear directly on the construction of a supply simulation model but which are nevertheless worthy of observation. They reflect a gradual change in the profile of the professoriate.

1) One-quarter of tenure stream appointments are women, with a high degree of variability across disciplinary groups. (See Figure 5)

FIGURE 5

PERCENTAGE OF FEMALE APPOINTMENTS BY DISCIPLINE, TENURE STREAM, 1986-87 to 1989-90

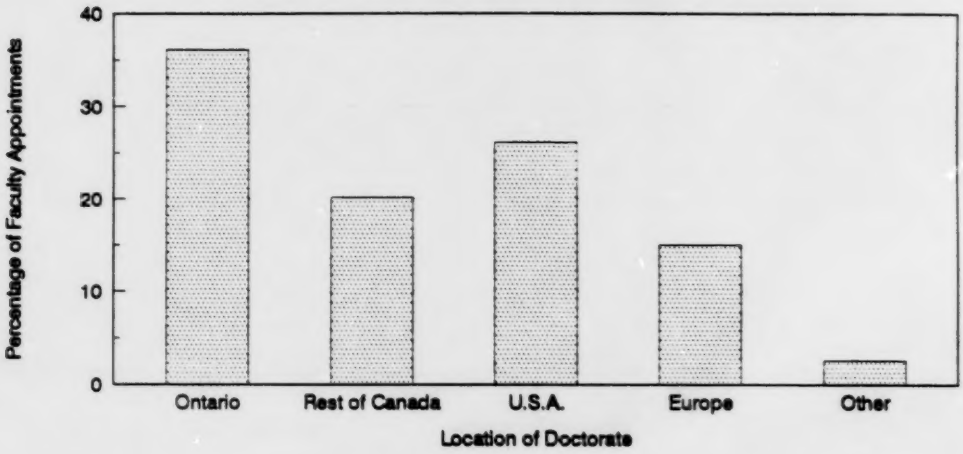


Source: Table E.4 (derived from UCASS database).

2) A growing proportion of Ontario's faculty members have received their highest degree from a Canadian university - nearly 60% of newly appointed faculty, as compared to 47% for the professoriate at large. (See Figure 6)

FIGURE 6

PERCENTAGE OF FACULTY APPOINTMENTS BY LOCATION OF DOCTORATE, 1986-87 to 1989-90

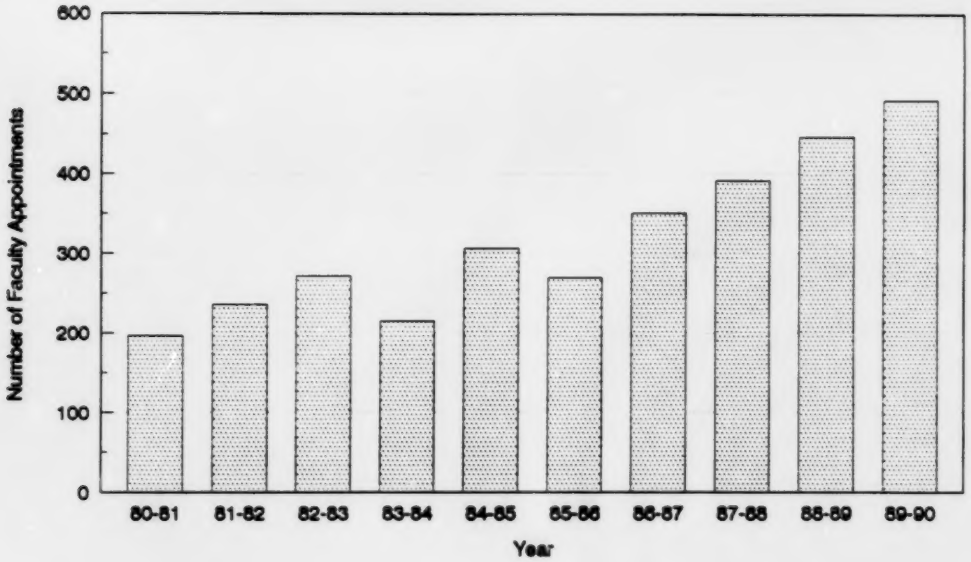


Source: Table E.5 (derived from UCASS database).

3) The number of new appointments to tenure stream positions increased substantially over the past decade, from just over 200 in 1980 to nearly 500 in 1989. While this increase can be partially explained by the replacement of a steadily increasing number of retirements, it is likely that an even larger fraction of the increase is attributable to various "bridging" programs implemented in the latter half of the decade. These programs, sponsored by the provincial government, the federal granting councils, private foundations, and by the institutions themselves, were designed to promote a temporarily accelerated rate of faculty recruitment in the late 1980s. (See Figure 7)

FIGURE 7

FACULTY APPOINTMENTS - TENURE STREAM
1980-81 to 1989-90

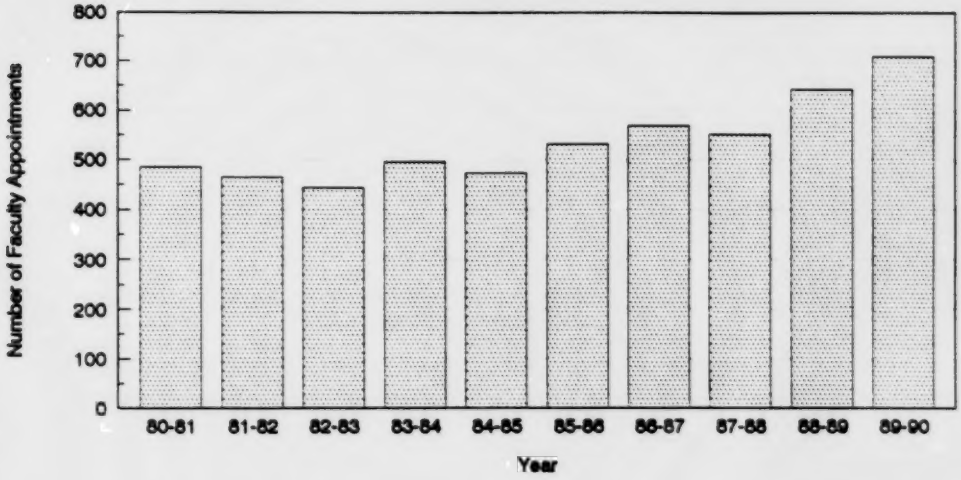


Source: Table E.8 (derived from UCASS database).

4) The number of new contractually limited appointments has grown, but at a slower and more uneven rate than for the tenure stream. Most of the growth occurred in 1988 and 1989. While it is not possible to arrive conclusively at a cause-and-effect relationship, this growth coincided with a large increase in undergraduate enrolment intake, accompanied by what were then temporary funding arrangements to accommodate the enrolment growth. It would therefore seem reasonable to assume that institutions reacted to what were thought to be temporary enrolment pressures by increasing contractually limited appointments. (See Figure 8)

FIGURE 8

FACULTY APPOINTMENTS - CONTRACTUALLY LIMITED
1980-81 to 1989-90



Source: Table E.8 (derived from UCASS database).

3.2 Trends in Doctoral Enrolment by Canadians

Approximately 40% of faculty appointments at Ontario universities are filled by Canadians who have either recently completed their doctorate or completed all but the defence of their thesis. Considering that this group constitutes the largest single source of supply for replacement professoriate, the Task Force devoted considerable attention to the analysis of recent trends in doctoral enrolment. Lack of growth in doctoral enrolment levels in the United States has been cited as one of the principal factors in projections of faculty shortages in that country.

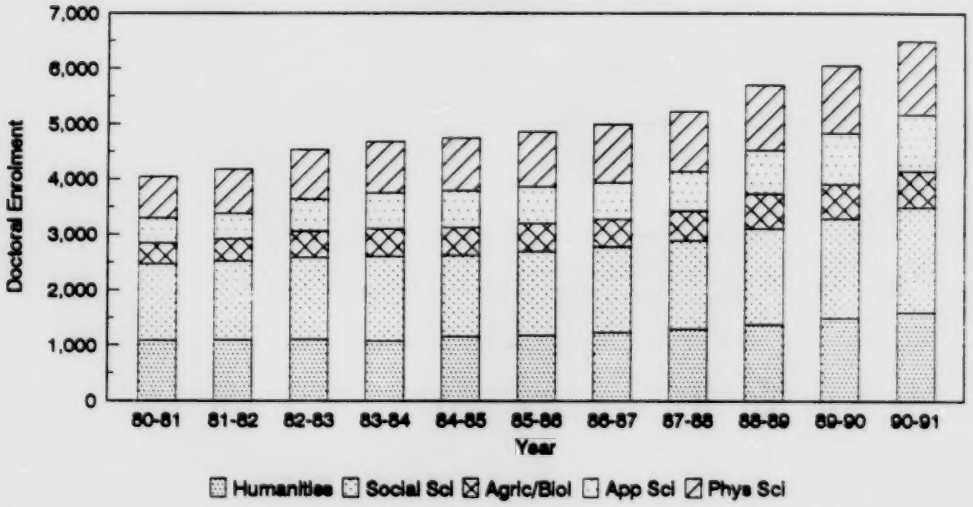
The analysis of Canadian doctoral enrolment trends was disaggregated into four component parts:

3.2.1 Enrolment in Doctoral Programs in Ontario
3.2.2 Enrolment in Doctoral Programs in Other Canadian Provinces
3.2.3 Enrolment by Canadians in Doctoral Programs in the United States
3.2.4 Enrolment by Canadians in Doctoral Programs in Other Countries

3.2.1 Trends in Doctoral Enrolment at Ontario Universities

Full-time doctoral enrolment at Ontario's universities has steadily and substantially increased over the past decade - by over 60% since 1980. (See Figure 9) This has outpaced by a large margin the 31% growth in undergraduate enrolment. Growth has occurred in all disciplinary groups, but not uniformly. For example, enrolment in doctoral programs in the social sciences has increased by about one-third, while it has more than doubled in engineering and applied science.

FIGURE 9
FULL-TIME DOCTORAL ENROLMENT BY DISCIPLINE
1980-81 to 1990-91

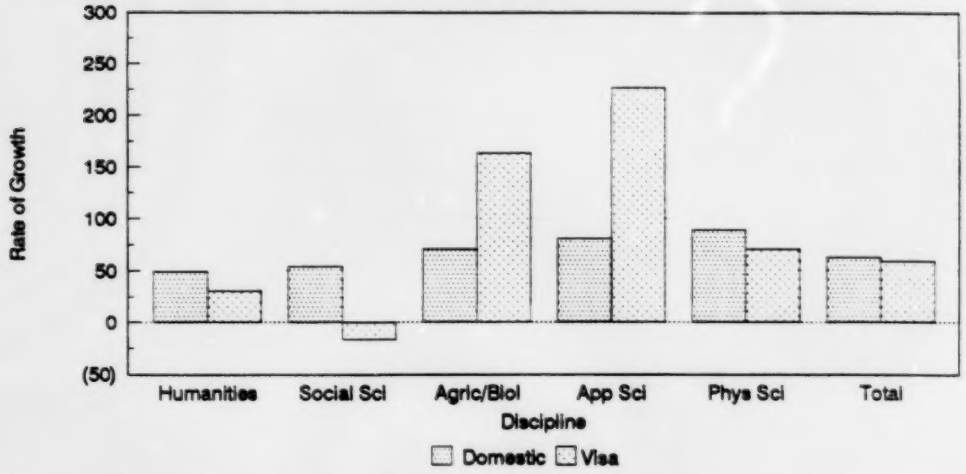


Source: Table F.2.3 (Ontario Ministry of Colleges and Universities).

This skewing of enrolment growth is largely attributable to patterns of visa student enrolment: while the aggregate rate of growth in domestic and visa students is approximately equal, growth in visa enrolment has been highly concentrated in the sciences while domestic growth has been more evenly distributed. However, for the purposes of this study the Task Force was concerned only with the growth in doctoral program enrolment by domestic students: for the purpose of this report, visa students are not considered to be a source of supply for the Ontario professoriate. (See Figure 10)

FIGURE 10

RATE OF GROWTH IN FULL-TIME DOCTORAL ENROLMENT BY DISCIPLINE 1979-80 to 1990-91



Source: Derived from Tables F.2.1 and F.2.2 (Ontario Ministry of Colleges and Universities).

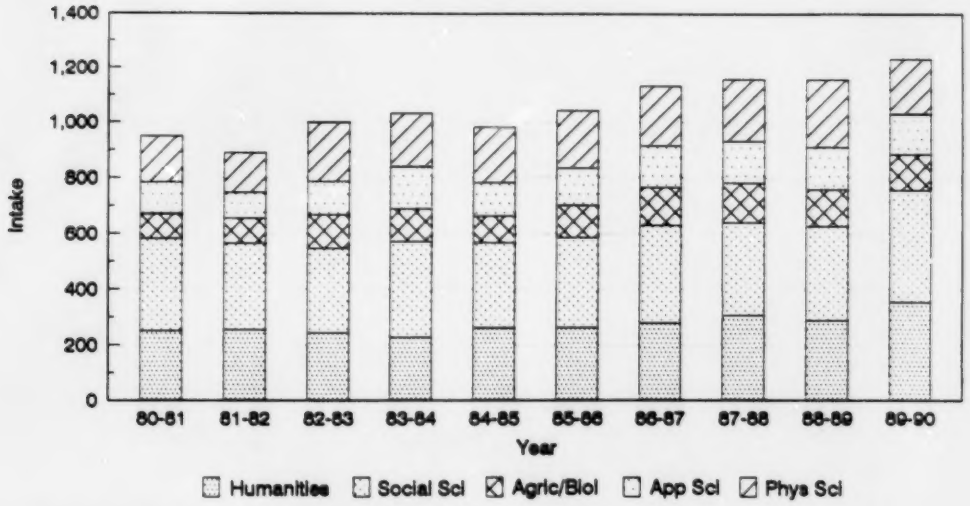
Recent trends on the intake of new domestic students in doctoral programs suggest that the increase in intake is largely concentrated in the humanities and social sciences. One might observe that this represents a flowthrough of recent trends in undergraduate enrolment. (See Figure 11)

The Task Force commissioned a study by the Ministry of Colleges and Universities of the completion rate of the cohort of students entering doctoral programs in the fall term of 1980. (See Appendix F) The study indicates variable and in certain instances very high rates of attrition in doctoral programs. In the case of the humanities and social sciences less than half of those who entered a program in fall 1980 had completed a doctorate by 1989.

The data indicate that completion rates are lowest in those disciplines where students take the longest to complete their degrees. The study revealed that the average length of time to complete a humanities program was six years, as compared to five years for the agricultural and biological sciences. (See Figure 12)

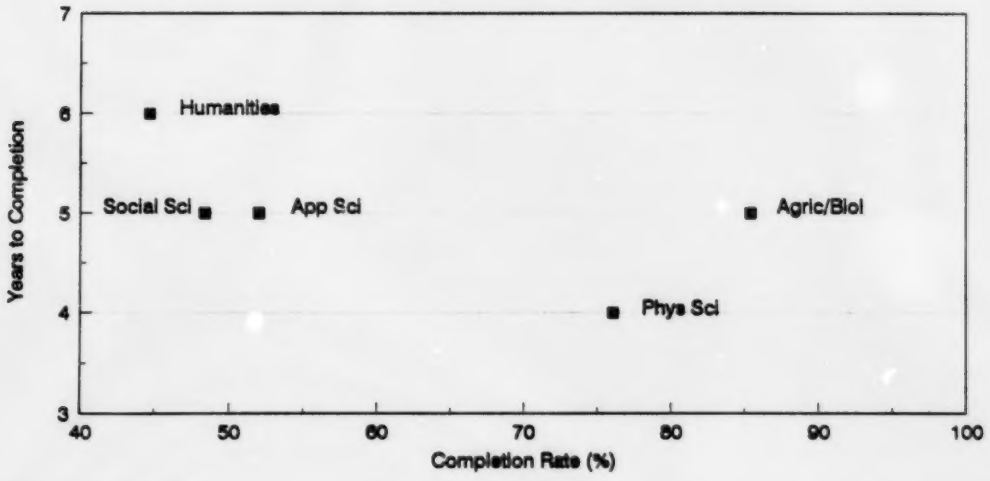
Due to constraints on the amount of funding for enrolment growth, institutions will undergo only modest increases in intake to doctoral programs after 1990. A simulation that takes account of historical rates of attrition, current levels of

FIGURE 11
INTAKE INTO DOCTORAL PROGRAMS BY DISCIPLINE
1980-81 to 1989-90



Source: Table F.1.1 (Ontario Ministry of Colleges and Universities).

FIGURE 12
YEARS TO COMPLETION AND COMPLETION RATES BY DISCIPLINE - 1980 COHORT OF ENTERING DOCTORAL STUDENTS



Source: Table F.4

enrolment, plus the flowthrough of higher recent intake, suggests that output from doctoral programs (excluding visa students) will increase by one-third over the next seven years. The rate of growth is highest in the applied sciences and in the humanities.

The Task Force also simulated the effects of a 10% increase in the output of Ontario's doctoral programs - this is not an expression of enrolment plans, but rather a test of supply models to the sensitivity of enrolment growth.

Thus, to the extent that Ontario's universities might look to the output of their own doctoral programs as a source of future replacement faculty, the supply projections suggest a growing pool of new graduates.

3.2.2 Trends in Doctoral Enrolment in Other Provinces

The recent discussion paper *Averting Faculty Shortages* prepared by the AUCC suggests that aggregate national trends in doctoral enrolment are very similar to Ontario's recent experience.[7] Total enrolment by Canadians in doctoral programs grew by 65% nationally between 1975 and 1988 (the period examined by the AUCC), compared to a 62% rate of growth in Ontario's doctoral enrolment between 1980 and 1990. As in the case of Ontario, national growth rates were higher in the sciences than in the humanities and social sciences. (See Figure 13)

The AUCC could not confidently project future doctoral output by program of study because it did not have access to the same data resources on a national scale as did this Task Force on a provincial basis. The AUCC did, however, project that total graduate enrolment could grow by approximately 35% between 1990 and 1997, if the growing numbers of undergraduate students enroled at Canadian universities were to pursue graduate studies in equal proportion to recent cohorts of undergraduates.

Thus the AUCC's assessment of potential growth in graduate enrolment for Canada of 35% is very close to the Task Force's projected planned growth in doctoral output for Ontario of 33%. Because of this similarity, the Task Force feels confident in performing a simulation of doctoral output from other Canadian provinces, which is a simple extrapolation of the Ontario projection.

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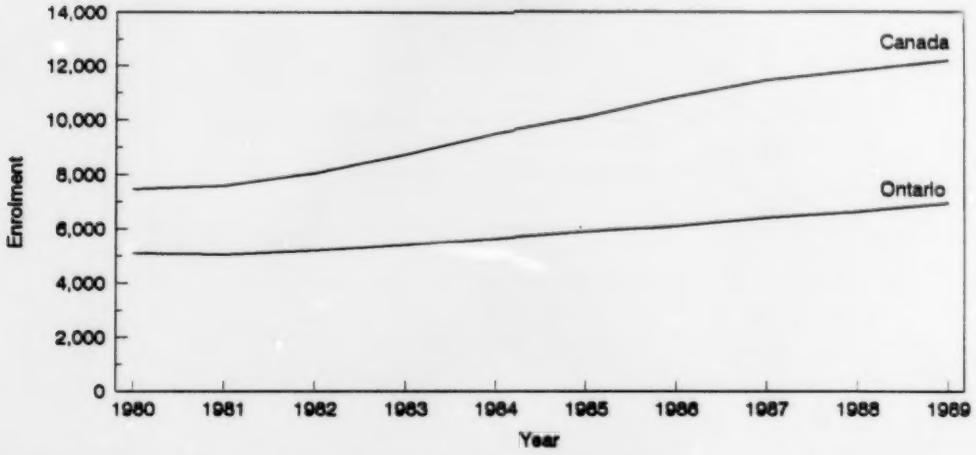
[7] Association of Universities and Colleges of Canada (AUCC). *Averting Faculty Shortages*. Ottawa: A.U.C.C., 1991.

FIGURE 13
GROWTH IN DOMESTIC DOCTORAL ENROLMENT
1980 to 1989



Note: Ontario figures exclude Royal Military College and the federated and affiliated institutions. Canada figures include the total population.

Sources: Ontario - Ontario Ministry of Colleges and Universities. Canada - Table F.8.

Based on survey data available from Statistics Canada, it appears that Ontario is a net exporter of doctoral graduates to other provinces. The number of Ontario doctoral graduates who leave for employment elsewhere in Canada exceeds the number of graduates of other Canadian doctoral programs who locate in Ontario by 10%. The simulations of supply therefore assume that the number of new doctoral recipients available for employment in Ontario is equal to 90% of Ontario's doctoral output. (See Table 2)

3.2.3 Trends in Doctoral Enrolment of Canadians in the United States

A significant number of Canadians pursue graduate studies in other countries, particularly in the United States and the United Kingdom. While the Task Force was unable to obtain sufficient data on offshore enrolment by Canadians to engage in precise simulations, information does exist that is useful in assessing trends.

There are at present approximately 14,000 Canadians registered at American universities, although this number is not subdivided by level of study. Available data on U.S. degrees awarded to Canadians suggest, however, that the majority are engaged in undergraduate study. Between 1980 and 1989 American

TABLE 2

NET DOCTORAL GRADUATES BY PROVINCE

Province	Doctoral Graduates Produced In:	Doctoral Graduates Employed In:	Net Supply/Import of Doctoral Graduates	Doctorates Employed as a % of Doctorates Produced
Atlantic Provinces	44	51	7	116%
Quebec	164	198	34	121%
Ontario	498	438	–60	88%
Western Provinces	213	224	11	105%
Not Stated	–	8	8	–
Total	919	919	–	

Source: Table G.4 (derived from Statistics Canada 1987 survey of 1982 graduates).

universities conferred doctorates on an average of 325 Canadians each year. Of this number, approximately 80 were conferred on Canadians holding permanent U.S. visas - in other words, Canadian citizens who are likely to remain in the United States.

The remaining 245 new doctoral graduates can be regarded as a potential source of supply to Canadian universities generally and to Ontario universities specifically. No attempt has been made to forecast a change in this population group - the data suggest that the annual number of Canadians receiving U.S. doctorates is comparatively stable. (See Table 3)

While the assumption of a stable population of Canadians receiving earned doctorates in the U.S. appears reasonable, it is possible that faculty shortages in U.S. universities might increase the proportion of those who stay permanently in the United States. In light of this possibility, the Task Force performed a simulation that assumes that 50% of those Canadians receiving a doctorate from a U.S. university who might otherwise be available for employment in Ontario will remain in the U.S.

TABLE 3

CANADIANS RECEIVING DOCTORAL DEGREES FROM AMERICAN UNIVERSITIES

Year	Permanent Visas	Temporary Visas	Total
1980	59	242	301
1983	74	260	334
1986	80	215	295
1989	97	261	358
Average	78	245	322

Source: Table F.5

3.2.4 Trends in Doctoral Enrolment of Canadians in Other Countries

A smaller but significant number of Canadians - approximately 900 in 1989-90 - are registered at universities in the United Kingdom, a large proportion of them pursuing graduate studies. The number of Canadians at the graduate level has declined slightly in recent years, but remains much higher than levels prevailing at the beginning of the 1980s. (See Table 4)

A further 2,000 Canadians are enroled in studies abroad, primarily in Europe. (See Table 5) Unfortunately, the Task Force was unable to obtain information on the proportion of this group who are pursuing studies at the graduate level. As a result, the supply projections have assumed that the proportion of Canadian students pursuing graduate studies in Europe is no different from patterns of Canadians studying in the United Kingdom (i.e., it is assumed that a majority are studying at the graduate level).

TABLE 4

CANADIANS STUDYING FULL-TIME AT UNIVERSITIES IN THE UNITED KINGDOM

Year	Undergraduate	Graduate	Total
1980-81	206	443	649
1983-84	174	441	615
1986-87	263	683	946
1989-90	294	611	905

Source: Table F.7

TABLE 5

CANADIAN STUDENTS STUDYING AT FOREIGN UNIVERSITIES, 1990

Country	Students	Percentage
United States	13,900	80.3
France	921	5.3
Germany	399	2.3
United Kingdom	1,003	5.8
Other	1,094	6.3
Total	17,317	100.0

Source: Table F.6

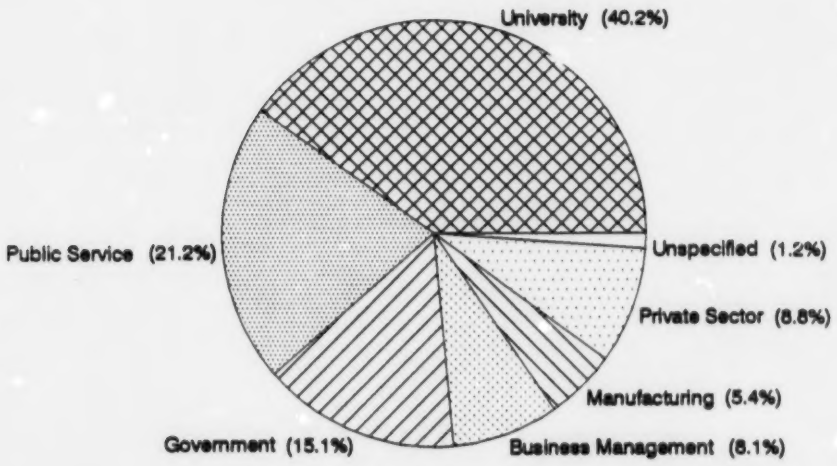
3.3 The Distribution of Doctorate Holders Across Employment Sectors

Having projected the pool of Canadians who will complete doctorates over the projection period, (and the proportion who will seek employment in Ontario) (see Section 3.2, Table 2), the final assumption to be made is an estimate of the proportion of new doctoral graduates in Ontario who will be available for employment by the universities.

The Task Force examined Statistics Canada survey and census data in order to establish the distribution of doctorate holders across employment sectors. Data from the 1986 census suggest that of those Canadians who hold a doctorate and who are employed full time, approximately 40% are employed by a university. As a 1978 survey of 1976 doctoral graduates indicated that 39.1% were employed by a university (see Figure 14), it was assumed that this proportion will continue in future years.

FIGURE 14

CANADIAN DOCTORATE HOLDERS EMPLOYED FULL-TIME BY SECTOR, 1986



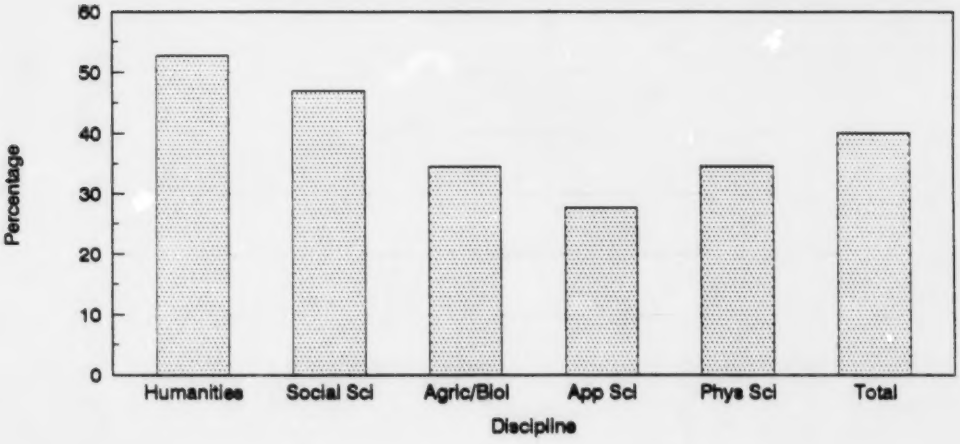
For definitions, see Appendix B, Item 4.

Source: Table G.3 (Statistics Canada. Special run based on 1986 Census.).

There are, however, differences across disciplinary groups: while over half of those holding an earned doctorate in the humanities are employed by universities, less than 30% of those holding an earned doctorate in the applied sciences are employed by universities. (See Figure 15)

FIGURE 15

PERCENTAGE OF DOCTORATE HOLDERS BY DISCIPLINE EMPLOYED FULL-TIME IN UNIVERSITY, 1986



Source: Table G.3 (derived from Statistics Canada data based on 1986 Census).

Universities employ proportionately fewer young doctorate holders than other sectors: 40% of doctorate holders over age 40 are employed by a university, compared to only 33% of those under age 40.[8] There are two plausible explanations for this:

- The data on new faculty appointments indicated that there is a net migration of individuals to university employment from other sectors.
- Universities underwent a period of comparatively few new appointments in the period immediately preceding the 1986 census.

[8] See Table G.2 in Appendix G.

This suggests that, to the extent that future retirements will increase the replacement requirements for the professoriate, an increase in replacement will occur at a different rate in other employment sectors. The Task Force has therefore performed two separate simulations of the proportion of new doctoral graduates who pursue a university career: one that assumes that the historical proportions prevail; and one that assumes that 50% of the growth in doctoral output over current levels will be available to the university sector.

4 RESULTS: PROJECTIONS OF FUTURE SUPPLY AND DEMAND FOR REPLACEMENT FACULTY

The Task Force cannot predict with great certainty either the future supply or demand for replacement faculty. It has, however, taken great care in the assembly and validation of data, and in the construction of simulation models that can project the impact on the academic labour market of changes in certain variables and conditions. In the results presented here, the Task Force has attempted to identify ranges of possible outcomes for both supply and demand. The ranges are intended to give a sense of the potential degree of surplus or shortfall in each disciplinary group under favourable, unfavourable, and unchanged market conditions.

For each disciplinary group, the simulations of demand presented here have been constructed to reflect:

- High Demand: Faculty turnover for reasons other than retirement and mortality is assumed to increase by 50%.
- Medium Demand: No change in faculty turnover, other than increased rates of retirement.
- Low Demand: Contractually limited appointments are gradually phased out, resulting in reduced replacement requirements.

Similarly, three models of supply have been presented:

- High Supply: Ontario's doctoral programs increase enrolment by a further 10% over current levels. Fifty per cent of the increased output is available to Ontario universities as replacement faculty.
- Medium Supply: No change in doctoral enrolment. No change in Ontario's capability to recruit from other jurisdictions.
- Low Supply: Ontario's capability of recruiting faculty and graduate students from the United States is reduced by 50%.

The supply and demand models are presented here in summary form for each discipline. (See Table 6) Data are aggregated at five-year intervals, and supply is then expressed as a ratio to demand. For example, if in a particular discipline

TABLE 6
SUMMARY OF SUPPLY AND DEMAND SIMULATIONS

	5 Year Summary of Supply & Demand Requirements				Ratio of Supply to Demand		
	1991 –1995	1996 –2000	2000 –2005		1991 –1995	1996 –2000	2000 –2005
Humanities & Related							
Low Demand	596	622	642				
Medium Demand	617	700	774				
High Demand	702	830	901				
				Low Supply/High Demand	0.93	0.85	0.78
Low Supply	653	705	705	Medium Supply/Medium Demand	1.17	1.10	0.99
Medium Supply	721	770	770	Medium Supply/High Demand	1.03	0.93	0.85
High Supply	727	795	795	High Supply/High Demand	1.04	0.96	0.88
Social Sciences & Related							
Low Demand	851	818	853				
Medium Demand	885	937	1,053				
High Demand	1,038	1,168	1,276				
				Low Supply/High Demand	0.98	0.91	0.83
Low Supply	1,017	1,060	1,060	Medium Supply/Medium Demand	1.29	1.26	1.13
Medium Supply	1,146	1,185	1,185	Medium Supply/High Demand	1.10	1.01	0.93
High Supply	1,171	1,240	1,240	High Supply/High Demand	1.13	1.06	0.97
Agricultural & Biological Sciences							
Low Demand	178	176	173				
Medium Demand	180	189	194				
High Demand	204	225	228				
				Low Supply/High Demand	0.85	0.78	0.77
Low Supply	173	175	175	Medium Supply/Medium Demand	1.07	1.03	1.01
Medium Supply	193	195	195	Medium Supply/High Demand	0.95	0.87	0.86
High Supply	203	205	205	High Supply/High Demand	1.00	0.91	0.90

TABLE 6 (cont'd)
SUMMARY OF SUPPLY AND DEMAND SIMULATIONS

	5 Year Summary of Supply & Demand Requirements				Ratio of Supply to Demand		
	1991 –1995	1996 –2000	2000 –2005		1991 –1995	1996 –2000	2000 –2005
Engineering & Applied Sciences							
Low Demand	284	290	281				
Medium Demand	291	310	316				
High Demand	325	365	370				
				Low Supply/High Demand	1.04	0.99	0.97
Low Supply	339	360	360	Medium Supply/Medium Demand	1.26	1.26	1.23
Medium Supply	367	390	390	Medium Supply/High Demand	1.13	1.07	1.05
High Supply	413	455	455	High Supply/High Demand	1.27	1.25	1.23
Mathematics & Physical Sciences							
Low Demand	441	452	480				
Medium Demand	454	499	560				
High Demand	518	598	655				
				Low Supply/High Demand	0.97	0.87	0.79
Low Supply	503	520	520	Medium Supply/Medium Demand	1.24	1.15	1.03
Medium Supply	561	575	575	Medium Supply/High Demand	1.08	0.96	0.88
High Supply	592	620	620	High Supply/High Demand	1.14	1.04	0.95
Total — All Disciplines							
Low Demand	2,350	2,358	2,429				
Medium Demand	2,427	2,635	2,897				
High Demand	2,787	3,186	3,430				
				Low Supply/High Demand	0.96	0.89	0.82
Low Supply	2,685	2,820	2,820	Medium Supply/Medium Demand	1.23	1.18	1.08
Medium Supply	2,988	3,115	3,115	Medium Supply/High Demand	1.07	0.98	0.91
High Supply	3,106	3,315	3,315	High Supply/High Demand	1.11	1.04	0.97

the supply model forecasts 300 potential replacement faculty for the period 1991 to 1995 and the demand model produces replacement requirements of 250 faculty, the supply/demand ratio is 1.2 to 1 (300 divided by 250), which indicates a 20% surplus of replacement faculty. Any ratio which falls below 1 to 1 indicates the existence of a shortage of replacement faculty.

4.1 Projections for the Humanities

The rate of required replacement for faculty in the humanities is forecast to increase by 21% by the end of the decade, assuming no change in patterns of turnover. At the same time, it is projected that the potential supply will increase by 12%, again assuming no change in current sources of supply. These projections suggest a potential shortage under current patterns of supply and demand.

Taking a less optimistic view - a model that juxtaposes high demand to low supply - shortages would begin to occur as early as 1995.

The increased rate of replacement, and the resulting potential shortage, arises primarily from the fact that age distribution of faculty in the humanities is more heavily skewed toward older faculty. This results in a proportionately higher rate of acceleration in faculty turnover.

4.2 Projections for the Social Sciences

Demand for replacement faculty in the social sciences will increase by 13% by the end of the decade, while supply will increase by 7%, assuming no change in conditions. Relatively low rates of growth in doctoral programs in the social sciences result in a relatively stable projection of supply.

The projections suggest that even under a pessimistic set of assumptions - which combine high demand and low supply - it is unlikely that serious shortages would occur before the end of the decade. This is principally due to an apparent surplus of candidates at present; increased demand could currently be met from excess supply.

4.3 Projections for the Agricultural and Biological Sciences

Demand is forecast to remain relatively stable for this disciplinary group, and the supply/demand projections suggest neither long-term surplus nor shortage of replacement candidates, barring a change in conditions. Of the five disciplinary groups, the age profile for the faculty in the agricultural and biological sciences is the most evenly distributed across age cohorts.

If demand were to increase as a result of increased competition, shortages could occur in the near future. Such shortages would be significant in proportional terms, but small in terms of absolute numbers, since this is the smallest of the five disciplinary groups.

4.4 Projections for Engineering and the Applied Sciences

Due to comparatively large increases in doctoral enrolment over the past decade, the projections do not suggest shortages in this disciplinary group. Even in the event of low supply combined with high demand, potential shortages are modest, and would not occur until the beginning of the next decade.

4.5 Projections for Mathematics and the Physical Sciences

Supply and demand appear to be in comparative equilibrium for this disciplinary group, except in the event that high demand would occur in combination with low supply. In such a case, shortages would not occur until the latter part of the decade.

5 THE COMPETITIVE POSITION OF ONTARIO'S UNIVERSITIES

The projections of supply and demand for replacement professoriate suggest that Ontario's universities are, on balance, well prepared for the 1990s in terms of increased production of doctoral candidates. However, the major uncertainty in the supply/demand equation will be Ontario's ability to retain existing members of the professoriate and to attract members of the professoriate from universities in other jurisdictions and from other employment sectors.

The data assembled by the Task Force for the period 1987 to 1989 indicate that there is a net migration to the Ontario professoriate from other Canadian provinces, from the United States and Europe, and from other employment sectors in the Canadian labour market. Can Ontario depend upon these sources of supply in future? Will the province continue to be competitive in the market that supplies three-fifths of our new faculty members?

The Task Force has reviewed the issue of Ontario's competitive position from two perspectives: compensation and employment conditions.

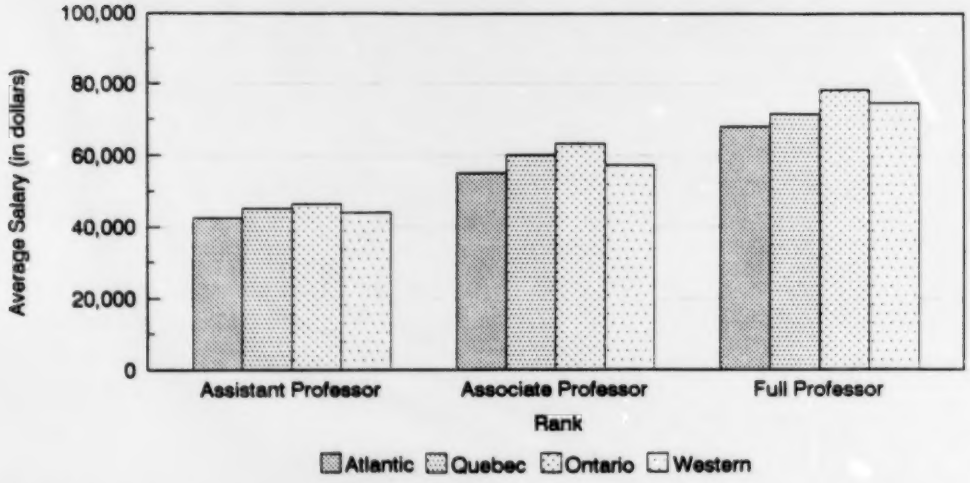
5.1 Compensation

Statistics Canada data for 1989-90 indicate that the average employment earnings by rank for full-time Ontario faculty is slightly above the national average. This analysis suggests that, to the extent that compensation is a factor in competition among Canadian universities, Ontario is not currently at a disadvantage. The situation will, of course, vary from university to university, dependant upon local compensation policies. (See Figure 16)

Data available from the 1986 census indicate that the total earnings of doctorate holders employed by Canadian universities are near the average for doctorate holders in all employment sectors. (See Figures 17 and 18) The average earnings suggest that universities are generally competitive with other employment sectors, although this aggregate information disguises anomalies at the disciplinary level. While doctorate holders in the humanities and the agricultural and biological sciences employed by universities fare comparatively well with their counterparts in other employment sectors, this is not true for doctorate holders in applied science and engineering. In this disciplinary grouping the average earnings for doctorate holders in the private sector exceed earnings for the university sector by a margin of about 10%.

FIGURE 16

AVERAGE SALARY BY RANK AND REGION, 1989-90

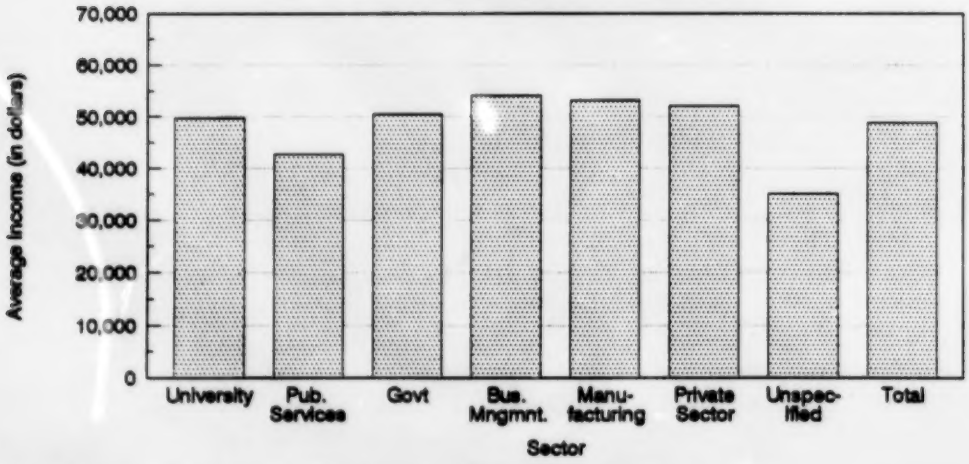


Note: Excluding medical/dental.

Source: Statistics Canada. Salaries and Salary Scales of Full-Time Teaching Staff at Canadian Universities. (81-258), annual.

FIGURE 17

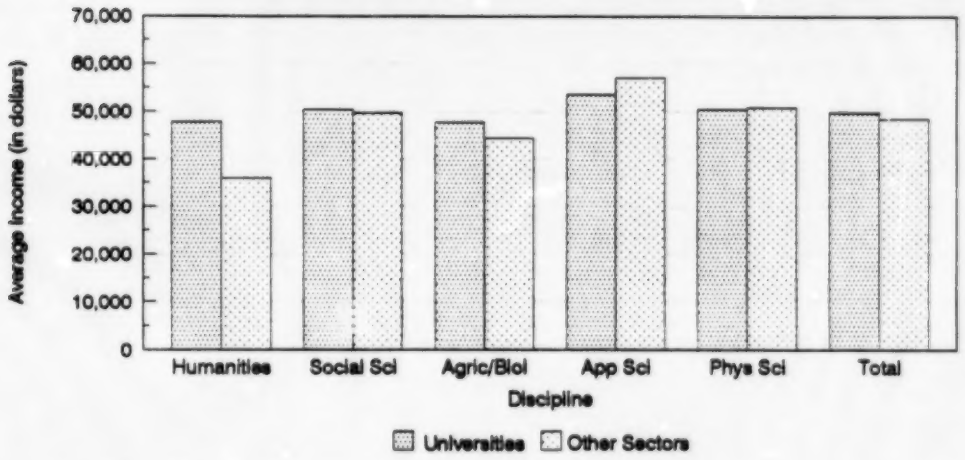
AVERAGE EMPLOYMENT INCOME OF DOCTORATE HOLDERS EMPLOYED FULL-TIME BY SECTOR, 1986



Source: Table G.5.3 (derived from Statistics Canada 1986 Census database).

FIGURE 18

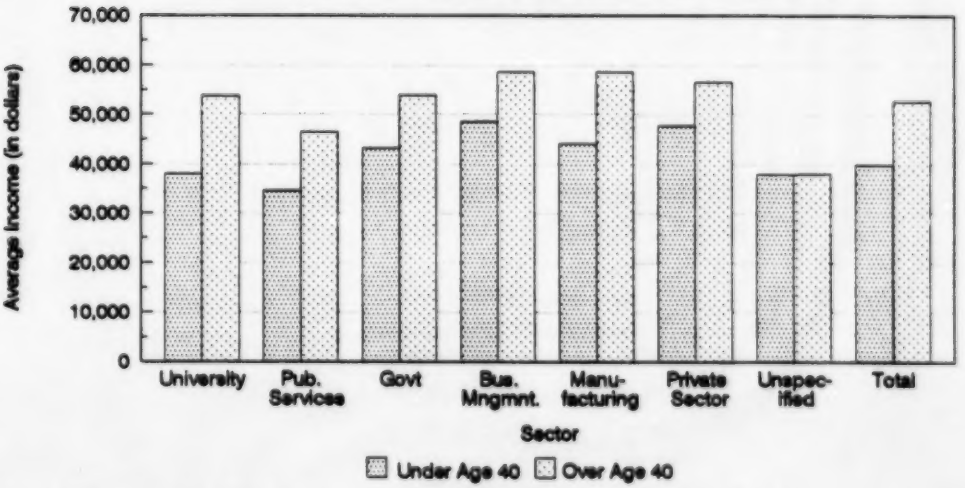
AVERAGE EMPLOYMENT INCOME OF DOCTORATE HOLDERS EMPLOYED FULL-TIME BY DISCIPLINE GROUP, UNIVERSITIES VS ALL OTHER SECTORS, 1986



Source: Table G.5.3 (derived from Statistics Canada 1986 Census database).

FIGURE 19

AVERAGE EMPLOYMENT INCOME OF DOCTORATE HOLDERS EMPLOYED FULL-TIME BY AGE AND SECTOR, 1986



Source: Tables G.5.1 and G.5.2 (derived from Statistics Canada 1986 Census database).

The COU recently commissioned a review of the competitive position of faculty compensation. In their 1988 report *A Comparative Study of Compensation of Faculty and Senior Administrative Personnel in Ontario Universities* the Hay Management Consultants concluded that faculty compensation, particularly for more junior faculty, fell short of the compensation levels of comparable professionals in other employment sectors. The consultants identified the delayed earnings characteristics of university progress through the ranks compensation programs as a major factor in the gap between average faculty compensation and that of their counterparts in other sectors. The consultants' observation is borne out by the census data. (See Figure 19)

As a partial counterbalancing factor, the consultants enumerated, but did not quantify, the non-monetary rewards of the professoriate:

> The rewards the professor receives for and from work range from extrinsic, e.g., compensation, promotion, and professional development, to intrinsic rewards exemplified by the freedom to pursue one's intellectual curiosity, the communication of the results of research and scholarship, peer recognition and so on. Research in the United States suggests that intrinsic rewards are important to both administrative and academic members in the university community, although compensation can be a source of dissatisfaction.[9]

None of the foregoing analyses should be regarded as conclusive evidence of competitiveness (or lack thereof) in Ontario's faculty compensation programs. The data do, however, suggest the following:

- Ontario does not appear to be at a disadvantage within the Canadian university academic labour market.
- The university employment sector in Canada does appear to be at a disadvantage with the private sector in certain disciplines.
- Non-monetary benefits to the professoriate have compensated in some measure for the disadvantage universities suffer in such disciplines.

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[9] Brian Hayman, Gail Cook-Johnson and Robert E. Sanderson. *A Comparative Study of Compensation of Faculty and Senior Universities*. Toronto: Hay Management Consultants, 1988, 12.

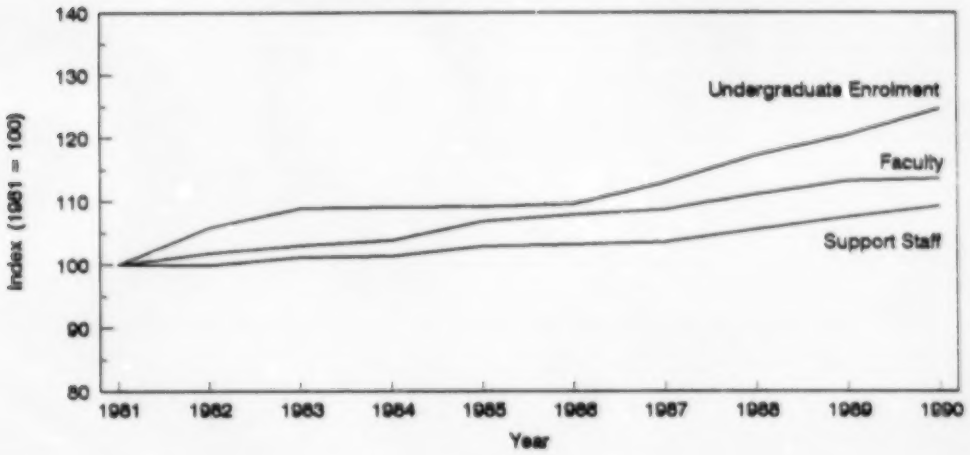
- The difference in faculty compensation between university and other sectors is most acute at the junior or entry level.

5.2 Employment Conditions

Over the past decade total university enrolment in Ontario has increased by over 30%, while the faculty complement has grown at only one-half that rate. The number of support staff at Ontario universities has grown at a still slower rate - by slightly less than 10%. Ontario's faculty have thus experienced two related difficulties over the decade: proportionately more students to teach and proportionately fewer staff to support them in their activities. (See Figure 20)

FIGURE 20

INDEX OF UNDERGRADUATE ENROLMENT, FACULTY AND SUPPORT STAFF, 1981 to 1990



Sources: Table H.4, and COU Survey of Non-Academic Staff.

Ontario's universities continue to fare poorly in terms of provincial operating grants: in each year of the past decade Ontario has ranked either ninth or tenth among Canadian provinces in terms of operating grants per student.

Comparisons of Ontario's operating revenue position with comparable universities in the United States reveals a still more serious disadvantage. In its December

1990 study of Ontario versus U.S. funding levels, the COU estimated that U.S. publicly funded universities receive, on average, one-third more revenue per student than Ontario's universities. In the executive summary to the report, the discrepancies are brought into high relief:

> The University of Toronto was compared with seven of the largest public universities in the United States. Only one, Ohio State, had funding as low as Toronto. The other six were considerably better off and some like UCLA and the University of Michigan were about 70% better funded than Toronto. As a group, the seven universities had total funding 40% greater than Toronto.
>
> Queen's University was compared with fifteen public and private universities across the United States. Only one, the University of New Hampshire, had funding as low as Queen's, and at the other extreme, one private university (Stanford) had revenues five times as great. Average revenues for the nine public universities were 40% greater than for Queen's, and the six private universities averaged 179% more than Queen's.[10]

In order to supplement these quantitative comparisons, the Task Force invited deans of Faculties of Arts and Science at Ontario universities to comment on recent difficulties they had experienced in recruiting faculty members. With few exceptions, the deans cited the following three areas in which they felt a competitive disadvantage:

- starting salary levels
- teaching loads
- the quality of research space and research support.

Should the academic labour market become considerably more competitive, the information and perceptions concerning Ontario's competitive position do not augur well. Ontario's universities are funded at rates considerably lower than comparable institutions in the United States and Canada, and are at a disadvantage regarding provision of start-up funding for research.

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[10] Council of Ontario Universities (COU). *Financing Universities in North America*. Toronto: C.O.U., 1990, vi.

6 CONCLUDING OBSERVATIONS

1) The analyses suggest that if shortages in replacement faculty are to occur, the shortages will be confined to three of the five disciplinary groups – the humanities, agricultural and biological sciences, and mathematics and physical sciences. It is also important to recognize that the analyses do not attempt to forecast labour market conditions at the sub-discipline level. Ontario's universities are currently experiencing recruitment difficulties in several areas, including economics, computer science, nursing, and certain sub-disciplines in engineering.

   The analyses do not therefore suggest that Ontario universities will experience large-scale shortages of replacement faculty across all disciplinary groups in the 1990s. However, shortages already exist, and may continue, within certain sub-disciplinary groups.

2) The projections are highly sensitive to assumptions concerning Ontario's ability to recruit faculty from other jurisdictions, and to the rate at which faculty leave Ontario's universities to pursue careers elsewhere. The assumptions may prove to be optimistic, especially considering certain competitive disadvantages experienced by Ontario.

   The Task Force therefore recommends that the COU, through the Council on University Planning and Analysis (CUPA), maintain a watching brief on trends in the academic labour market, and that the findings be reported annually to the COU.

3) In its review of data concerning the supply of new doctorates from Ontario's graduate programs, the Task Force was surprised and concerned at the high rate of attrition in certain disciplinary areas, most notably the humanities and the social sciences. The Ontario Council on Graduate Studies is now apprised of this issue, and the Task Force welcomes further study on the matter of doctoral throughput rates.

4) The Task Force was unable to include part-time faculty in its analyses and projections due to a lack of complete and reliable information. It is therefore recommended that CUPA take this matter under advisement and review data requirements and ways in which they might be met.

5) Another significant shortage of information occurred in the study of enrolment by Canadians in graduate programs outside the country. The Task Force recommends that the COU enter into discussions with the AUCC and Statistics Canada, with the objective of assembling and maintaining information concerning Canadians who study abroad.

6) Finally, the principal legacy of the Task Force will be the various databases concerning Ontario faculty members and doctorate holders employed in other sectors of the labour market. It is strongly recommended that this effort be continued in future, and that the COU acquire new versions of the appropriate Statistics Canada data sets as they become available. There exist significant opportunities for further analysis on certain databases already assembled by the Task Force, in particular with the data from the 1986 census.

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